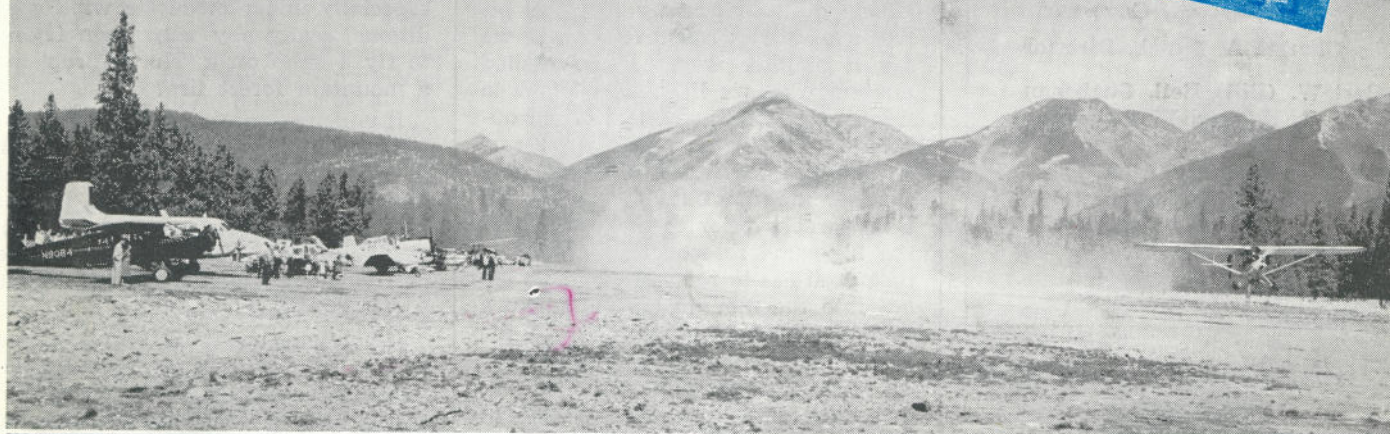


# MONTANA AERONAUTICS COMMISSION



Volume 17 No. 10

October, 1966

## NASAO ELECTS JORDAN PRESIDENT MAC's LYNCH—FIRST VICE PRESIDENT

Thomas K. Jordan, Director of the Wisconsin State Aeronautics Commission, was elected President of the National Association of State Aviation Officials at the group's 35th annual meeting September 6, 1966. Other new officers elected at the session this year include Charles A. Lynch, Montana, First Vice-President; Francis R. Gerard, New Jersey, Second Vice-President; A. B. McMullen, Executive Vice-President; and James D. Ramsey, Michigan, Treasurer. Of the 43 State membership to NASAO, aviation officials from 41 States participated in the three-day annual meeting held in Oglebay Park, Wheeling, West Virginia. The member States of the National Association of State Aviation Officials are pledged to foster aviation as an industry, as a mode of transportation for persons or property, and as an arm of the national defense; to join with the Federal Government and others in research, development, and the advancement of aviation; to develop uniform laws and regulations; and to otherwise encourage cooperation and mutual aid among the several States.

Among the numerous agenda items

on this year's program were thorough presentations from both governmental and commercial segments of the industry on State-Regional economic and statistical surveys; highlights of the Economic Development Act of 1965 and public works; a thorough Washington report on the status of all legislation affecting aviation presently before the Congress; State airports; education; training and safety programs; an analysis of the Federal programs and the administration of the Federal Aid to Airports Program.

The probable "highlight" of this year's program was the assurance of Senator Jennings Randolph, who promised to lead the fight to arouse Congress to meet the needs of small city airports which cannot be served by present-day airline type aircraft. Senator Randolph also told NASAO that it is up to State officials to develop the coordination between state, local and Federal officials necessary to establish priorities for airport aid programs since present-day requests far exceed present availability of funds under FAAP.

## YELLOWSTONE AIRPORT

Aviation facilities now closed for season at West Yellowstone. No lights. Opened day light hours only. Phone Available.

## SCHOOL OF AERONAUTICS & RELATED TRADES HAS RECORD ENROLLMENT

The School of Aeronautics and Related Trades of the Helena Senior High School has the largest starting enrollment since World War II. Forty five students, 24 enrolled in the Airframe classes and 21 enrolled in Aircraft Engines, are attending from Gildford, Billings, Helena, East Helena, Missoula, Miles City, Nashua, Wolf Creek, Cut Bank, Milltown, White Sulphur Springs, Dillon and one out-of-state student from Lemmon, South Dakota.

Enrollment for this year's class was completed by March of 1966. Special note to students contemplating attending the 1967 session—your applications should be submitted in the very near future.

### General Information

The Department of Aeronautics has been a growing part of the Helena Public School System since 1933. From its beginning the school has been in existence to train young men who have the interest and ability to profit from the courses offered.

America's changing economy provides few job opportunities for unskilled labor. The largest increases for

(Continued on Page 3, Col. 1)



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of the  
**MONTANA AERONAUTICS  
COMMISSION**

Box 1698  
Helena, Montana

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## DIRECTOR'S COLUMN



Charles A. Lynch

### ANOTHER SIDE OF HUNTER SAFETY

One would normally ask, "What in the world has the big game hunting season got to do with aviation safety, as such?"

The facts of the matter are that almost annually from one to three weeks prior to the opening of the big-game hunting season in any particular area in the State of Montana, we normally have substantial evidence that flying safety takes second place to the prime interest of game-spotting in quite a large number of flights into the back country of many of our most mountainous and densely-covered wooded areas.

Let's take just a few minutes here to analyze the type of flying required to do a safe, heads-up job on game-spotting, while at the same time looking out for the best interests of the flight from a safety standpoint.

We frequently have the condition where an avid sportsman, who has worked hard and long all summer, is now planning to take his annual vacation during the hunting season and, naturally, with the hopeful outlook of having a really good vacation, making his hunting season really worth-

while. He becomes very enthusiastic with the possibility of making a preliminary survey of the wild game in the mountain areas so as to make a fair determination as to the potentialities of a particular mountain area for what he hopes will be the best results for his time and effort.

This quite frequently involves pilots who are avid hunters or, if we say it another way, serious-minded hunters who are licensed pilots who frequently have had little or no opportunity to fly on any regular sort of basis throughout the entire long summer months, but anywhere from a few weeks prior to the opening of the big-game season their most sincere desire is to rent an airplane, get out into the mountains, and make a preliminary determination as to the potentials in various areas for their big-game hunting prospects.

Anyone who has done this type of flying knows a number of factors which are completely dissimilar from the ordinary day-to-day type of business or pleasure flying that is done by the average pilot and know the serious hard-work aspects and the type of equipment necessary to do a real heads-up job of minimum altitude mountain flying.

As these flights are normally the round-robin type, out and back to the same airport, and as the cross-country cruise speed of the aircraft involved is generally of little or no consequence, then it is quite normal for a pilot or group of pilots or hunters to join economic forces and rent the lowest cost, and frequently the lowest horse-power airplane available, from the local operator.

As the flight is dispatched on a "local" basis, it is assumed that it is quite an ordinary pleasure-type flight and naturally cross-country planning, weather information briefing, and normal pre-flight activity is at a minimum.

The next factor to enter the case is, of course, frequently that in the pleasure and anticipation, once some game is spotted, it becomes almost an obsession for all persons aboard the aircraft to enjoy the view of the game animals on the ground.

This, then sets the stage for the four items of criteria which, regretfully, on occasion are the direct causes of something far from aviation safety.

These four important factors can be enumerated as follows: (1) lack of recent experience, (2) lack of recog-

nition of the serious type of flying involved, (3) minimum pre-flight thought and planning, (4) diversion of attention.

At this point in our discussion, let's ask a few serious questions. Is the actual job of game-spotting in a narrow, high-altitude mountain valley, especially under moderate wind conditions, really any safer than trying to fly a TBM on a "slurry drop" on a mountain forest fire?

If under normal conditions most operators doing a real professional job of mountain flying with equipment of 240 horse power or more in this type of country, do you honestly feel that you should attempt a similar type of flying with aircraft of 145 to 160 horse power?

If you have not flown regularly and frequently during the previous summer months, do you honestly feel that this is the type of flying job that you should use to refresh yourself and re-establish your ability?

If it is your intention to be gone on such a flight from one to two hours or more, don't you really feel that a complete weather briefing relative to weather in the surrounding area, and especially the winds-aloft report, might have a substantial bearing on the success of your flight?

If, for any number of reasons, it is necessary to use a low-powered aircraft, don't you feel that it is entirely practical to leave at least half of the seats empty, allowing yourself maximum performance for the aircraft in hand?

Don't you feel that it is entirely practical to insist that the man riding as game-spotter really spots game and that the man riding as pilot does absolutely nothing else than take care of his airplane?

Don't you feel that if any of the above adverse factors enter into the planning for the flight that is establishes an excellent reason to make this a charter in the hands of a professional?

Let's plan for a real heads-up hunting season this fall and leave the "bang" to the gun.

**FOR SALE:** 1960 Mooney MK20A—Excellent condition—Total time 1,350 hrs.—150 hrs. on chrome major—MK12 Radio—full panel, R. Beacon—Aux. Tank. Price: \$8,000. Contact: Walt Sterhan, 1220 South Bozeman, Bozeman. Phone: 587-7679 evenings.

**FOR SALE:** 1954 Tri-Pacer—300 hrs. SMOH—New Annual—Primary Panel—Superhomer. Price \$3,000—Firm. Contact: V. E. Castie, P.O. Box 164, Billings. Phone: 245-7214 weekends.



## AERO SCHOOL

(Continued from Page 1)

employment are in the professional and technical, clerical and sales, skilled craftsmen and semi-skilled operatives. The Department of Aeronautics provides training for people in these fields; Trade preparatory, Trades and Industry Technology, and Trade extension.

The Department of Aeronautics and Related Trades, Helena Senior High School, has been designated by the State as a Vocational Training Center. This department is located in a separate building situated near the Municipal Airport. The school is housed in a building of 28,500 square feet, including shops and classrooms. Since 1941 the school has been certificated by the Federal Aviation Agency for the training of Airframes and Powerplants mechanics.

### Courses

Qualifying high school students may enroll in all courses offered.

Airframes, Aircraft Powerplants, Electronics and Farm Machinery are five (5) hour per day courses and the only ones offered on the post high school level.

Courses are designed to provide fundamental training for securing apprenticeships and employment. Additional experience is needed before a student can meet the requirements for a highly skilled tradesman. Promising students who learn the fundamentals of a trade, through theory and shop experience, will not only make better tradesmen and technicians, but will also find it easier to secure apprenticeship or employment and to advance more rapidly in their chosen fields.

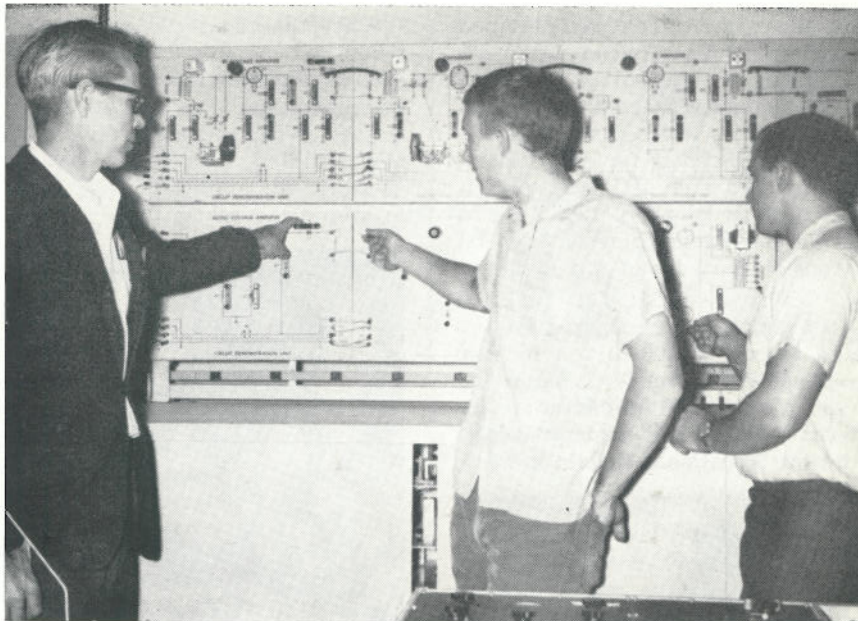
All members of the staff are either journeymen in their respective fields or have instructor's rating in the subject taught. The graduates of the school attest to the quality of the training given and can be found as leaders in many branches of industry and research.

A general safety program is stressed, with particular emphasis on those safety procedures involved in individual courses.

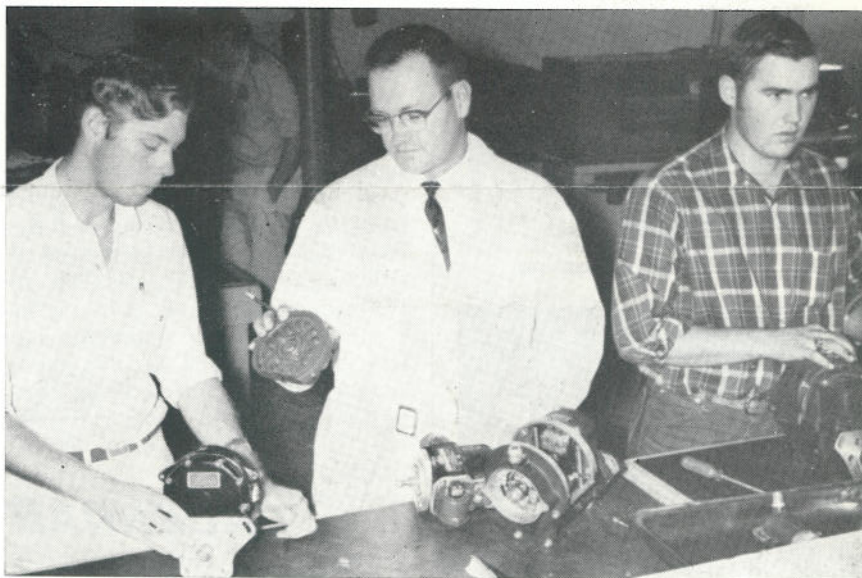
Audio-visual aids, including film strips, motion pictures and slides are used in both shop and related work.

### Length of Courses

Classes begin on the fall opening day and continue by the school calendar until closing day in the spring as set by the Board of Trustees for



Hal Francks, instructor, with students of the Advanced Electronics Class.



A session on Magneto and Ignition Systems in Aircraft Engine Class with Instructor Chambers.

Helena School District No. 1.

### Who May Enroll

In order to enroll in courses at the trade school a student must have successfully completed the work required for Junior standing in high school. Exceptions to this requirement may be made with the endorsement of the high school principal, and the approval of the faculty of this trade school.

Entrance requirements are based on the aptitude, interest and ability of the student to profit by the instruction offered in the course or courses

in which he is to be enrolled. Enrollees usually fall in the following categories:

1. High school resident students have first choice and priority at this trade-technical center.

2. High school graduates under age 21: Any high school graduate residing within the state of Montana may apply for enrollment in this school. Tuition for students under age 21 is \$250.00 which can be paid by the county of his residence since this is a designated Area Trade School. The procedure is to fill out an application for

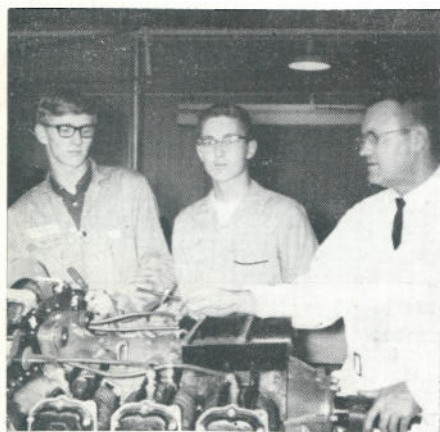


admittance which can be obtained from the School in Helena. Upon acceptance by the School of Aeronautics and Related Trades, the proposed enrollee applies to his County Superintendent of Schools for an Authorization for Transfer of Funds to Helena School District No. 1. All forms must be completed prior to July 1st previous to the year of attendance.

**3. Adults over 21:** All qualified adults over 21 may attend and are expected to pay a \$400 tuition for one school year. This school is approved by the Veterans Administration for Veteran training and students selected by the Vocational Rehabilitation.



**Aircraft Engine Classroom**



**Instructor Bill Chambers checks engine timing procedures with students.**

#### **New Building**

Voters of the Helena High School District approved a bond issue for the construction of a new technical-vocational high school in May, 1965. Preliminary plans are now on the drawing board, and construction of the new building should be started in early 1966 and completed in the fall of 1967.

When this facility is completed, the school will be able to offer additional courses, and provide better space and equipment for the operation of all classes. With the completion of the new building, it is hoped that more, possibly all, applicants will be able to attend the school.



**Beginners Aircraft Welders Class.**

**REMINDER:** If you are considering applying for the 1967 school term, send your application just as soon as possible. Applications are available from the School of Aeronautics and Related Trades, Helena Senior High School—2300 Poplar, Helena, Montana.



## **CALENDAR**

**October 1-6, Palm Springs, California—Aircraft Owners and Pilots Association Plantation Party.**

**October 5, Helena—Montana Aeronautics Commission monthly meeting.**

**October 5, Helena—Bid Opening on Hysham Airport.**

**October 9-11—Norman, Oklahoma—National Airports Conference of American Association of Airport Executives and the University of Oklahoma.**

**October 11, Bozeman—Western Montana Service Case Hearing.**

**October 13, Missoula—Western Montana Service Case Hearing.**

**FOR SALE:** Cessna 175—zero time on rebuilt engine—take over present contract. Call State Credit Corp., 543-8373, 1821 Holborn, Missoula, Montana.

## **FAA INSPECTOR'S CORNER**



### **AIRCRAFT MAINTENANCE**

As defined by Regulation, you, the pilot/owner, are primarily responsible for the maintenance of your aircraft. In the past we discussed preventive maintenance as outlined in FAR Part 43 which may be performed by the owner if he is a certificated pilot, the aircraft is owned by him and is not used in air carrier service. As we have been questioned many times by pilots asking for more information about maintenance let's discuss this point a little further.

Occasionally we note that an airplane owner has performed maintenance such as recovering the wing or control surface, or has installed a radio with the idea that this was all right and now all he had to do was find a mechanic to sign it off. A mechanic may supervise maintenance performed by the pilot/owner, however it should be direct supervision while the work is in progress. Whether or not the aircraft is returned to service is based on the mechanic's certificate and its associated privileges, and not who does the work, therefore the work without the supervision is not correct.

Even though a pilot/owner may not do all the maintenance to his aircraft, he does have a very important function to perform in maintaining the overall quality of the aircraft he flies.

For instance, discussion with factory personnel indicates that the main reasons for engines being returned to the factory for premature overhaul are improper fuel, improper operation and dirt ingestion, in that order. Most of these items are controlled by the pilot, by paying particular attention to details.

When you land at a strange airport, do you visit with the line boy and observe the servicing operation or do you tell him "fill 'er up" and head for the coffee shop? The cowboys used to feed and water their horses first, and possibly that same philosophy could be put to good use today. Observe the refueling operation to see that the fuel octane and capacity requirements are obtained from the placards near the filler neck. Is a ground wire attached? Is the line boy



careful with the nozzle so as to eliminate introducing dirt or other foreign particles into your fuel system? Does he hold the nozzle away from the filler neck and avoid scratching the leading edge by draping the hose over his shoulder or using a pad? Some of the aircraft now use rubber fuel cells, and a damaged nozzle dropped into the fuel cell so that it hits bottom ruins the cell.

Are the oil dispensers clean? Does he ask you for the type oil you use, or ask if you brought your own? If he does all this, you can be sure that he is well trained, conscientious and competent, as are most of the line boys in Montana.

Ground operation is particularly critical in the newer type aircraft. Excessive ground operation should be avoided. Normally the engine will be ready to go when it will accept a rapid throttle without hesitation and the oil pressure remains steady. In most cases adequate heating is accomplished while taxiing to the runway.

Follow the aircraft manufacturer's manual for engine runup, takeoff, climb and cruise procedures. To assure maximum cooling don't overlook the engine baffling. Every time the cowl is removed the baffle should be reexamined for proper position. In most cases this can be done through the air intake ports in the front of the engine.

The 25 hour inspection is very important. This inspection, if performed by a mechanic should catch deteriorated items before they become critical. The oil change procedure should include a method of straining the drained oil so as to detect any foreign particles suspended in the oil. A light cloth placed over the drain bucket screen works out very well for this purpose. The engine oil and fuel screens should be inspected and cleaned. Inasmuch as this involves raising or removing the cowl, now is the time to give the engine an examination for loose fittings, fuel or oil leaks, chafing lines, binding controls, cracked baffling, exhaust stacks, etc. All of these items if attended to promptly will reduce the maintenance costs on your aircraft.

An aircraft battery is made lighter to conserve weight and therefore needs more care than a car battery. The battery water should be checked for specific gravity every 25 hours. Note the color of the water. If it is

getting brown the battery is deteriorating and you can expect problems later on. Excessive moisture in the battery box or adjoining area is an indication of overcharge generally caused by malfunction of the voltage regulator. This results in damage to the battery and the generator. The fuselage area adjacent to the battery should be thoroughly washed and neutralized with a mixture of soda and water.

The carburetor air filter should generally be serviced every 25 hours here in Montana due to the dusty conditions we operate under. A brand new air filter is only 90 percent effective. If an aircraft has been tied down on the line or even parked in a T hangar, be suspicious that the air filter area may have filled up with dust which will be drawn into the engine when it is started.

While looking through the manufacturers' service bulletins I note that the engine manufacturers today stress the importance of magneto to engine timing. Timing advanced only one degree can result in a substantial increase in cylinder head temperatures. For every hundred hours of operation the magneto points open and close 7,000,000 times, and the cam follower skids 200 miles. The magnetos operate in an area that is approximately 250 degrees F. which is almost hot enough to cook a 10 lb. turkey on a three hour flight. They should receive a little special attention. Every fourth 25 hour inspection, if you do not require 100 hour inspections, at least have the mechanic check the magneto timing, the condition of the magneto breaker points, and clean and bench test the spark plugs. After every 300 or 400 hours of operation the cost of cleaning and bench testing the spark plugs should be compared with the price of a set of new spark plugs which will result in improved engine operation, and fuel economy.

The mechanic is a businessman operating a repair facility on the local airport to serve you, the pilot/owner. He needs your business to survive and is doing everything he can to satisfy you as a customer. In most cases, he is trying to give you the type of maintenance that he thinks you want and is governed by his own conscience, the business requirements, the demands of his boss, and the standards established by his local inspector. Talk your maintenance requirements over with him.

## AIRPORT NOTES



By James H. Monger,  
Assistant Director

The summer of 1966 has been one of the busiest in the history of the airport development in Montana. Many airports were dedicated which were finished late last fall, and several others which were completed this year. The airport dedications will be just as numerous next year. Major airport reconstruction or improvement projects this summer have recently been completed at the following locations: Bozeman—taxiway; Missoula—taxiway; Great Falls—reconstruct runway; Anaconda—pave runway; Benchmark—new airport; Troy—pave runway; Plentywood—re-surface runway; Broadus—new airport and Scooby—runway sealcoat.

Several projects are still underway and construction should be completed yet this fall. These locations are as follows: Dillon—pave runway; Polson—extend and pave runway; Billings—taxiway system; White Sulphur Springs—fence runway markers and "T" hangars; Havre—extend runway; Kalispell City Field—new runway; Butte—Administration building addition; Anaconda—fence and lighting; Miles City—hangar construction; Shelby—hangar construction; and Lewistown—hangar construction.

Several airports in the State initiated hangar projects which are now underway. The "T" hangar projects are financed by the airport boards through a loan from the Aeronautics Commission. In most cases, a typical "T" hangar in Montana will cost approximately \$3,000 per unit, which does not include floors, electricity, heating or electric doors. The airport boards, then in turn rent the "T" hangars and repay the Montana Aeronautics Commission loan from the hangar rentals.

This summer the Aeronautics Com-



mission airport maintenance crew installed windcone assemblies at Harlowton, Ennis, Livingston, the Flying "D" ranch, and at Wisdom.

The Aeronautics Commission air-marking and airport maintenance crew also installed new fibreglass, white cone, runway markers at Canyon Ferry, Sweetgrass, OxBow, Lincoln, Elliot Field, Polebridge and White Sulphur Springs. Markers will also be installed at East Poplar and Morgan border crossing airstrips later this fall.

Many airports have completed preliminary engineering studies and are in an early phase of the airport improvement project. The airport projects that are presently proposed and under study are to be located at Noxon, Philipsburg, Rudyard, Hobson, Glendive, Circle, Baker, Wolf Point, East Glacier, Billings and Hamilton. Some airport projects have passed the study and flight check stages, and are actually under engineering and on the drawing table this winter. Bids are expected to be called for early spring for the construction of airports at Stanford and Hysham. Major airport improvements at Choteau, Sidney, Conrad, Glasgow and Laurel will start next spring.

New airports, or airport improvement projects have been programmed at the following locations; however, the airport projects are dormant and awaiting local action before they can proceed any further: Libby, Valier, Fairfield, Bigfork, Absarokee, Melstone, Big Timber, Winnett and Wibaux.

**West Yellowstone.** Yellowstone Airport, located at West Yellowstone, Montana, has completed its second season and will remain open now only as long as weather permits, and for daytime use only. The lights have been turned off for the year and the aviation services are no longer available. There is a pay telephone available.

**MAC/USFS.** The air operations and engineering branch of the United States Forest Service will meet with the Aeronautics Commission Staff on October 25th. This joint meeting will be held to discuss airports that are of mutual interest to both the Forest Service and the aviation public in Montana. Fifteen or twenty various airports and proposed airport projects will be discussed, and any comments that any pilot has in the meantime, will be welcome for this joint meet-

ing. Please refer them, in writing, to this Office, prior to October 25th. The Aeronautics Commission has always enjoyed a great deal of cooperation from the Forest Service on mutual-interest airports.

**Beacon Program.** The Aeronautics Commission airport beacon program is rapidly being completed. The following sixteen airports will be receiving a new beacon and tower: Valier, White Sulphur Springs, Stanford, Seeley Lake, Ryegate, Polson, Lincoln, Laurel, Kalispell City Field, Jordan, Glasgow (tower only), Augusta, Anaconda, Broadus, Chinook and Plentywood (light only).



**Kalispell City Field's new Beacon.**

**Hughes Creek.** Interested parties in southern Ravalli County proposed to build a public airstrip on Hughes Creek, in the most southwesterly part of Montana, near the Montana-Idaho line and Lost Trail Pass. The proposed airstrip was planned for an area between Saddle Mountain and Thunder Mountain, approximately forty miles directly south of Hamilton. The site investigation proved negative and the Aeronautics Commission Airports Division recommended that no public funds be involved due to the many adverse conditions in this location; mainly terrain, gradients, poor approaches and geographic location.

**FOR SALE:** 1965 PA-30 Twin Comanche—Relicensed to June 1967. 500 Total hrs.—2 Mark 12/360—2 VOA/4—Bendix T12B—Marker beacon—Electric trim—Palm beach interior and exterior—Alcor unit—Factory installed console oxygen—Turbochargers. One owner—ship like new. Contact Al Gillis, P.O. Box 336, Billings, Montana.

**WILL TRADE:** Cessna 170—For lake frontage on Seeley, Flathead or Swan Lake. Aircraft has 50 hrs. SMOH—VC12 Narco with Omni—partial panel—Annualled to 5-1-67. Will consider taking Boat & Motor as part payment. Contact: E. G. Neidhardt, 1016 College Ave., Deer Lodge. Phone: 846-2501.

## A CASE IN POINT

By Charles A. Smith  
Commission Attorney

### "NEGLIGENCE—DAMAGE TO PLANE—RUN UP AND "REVVING" ENGINES"

The plaintiff in this case held a private pilot's license and at the time owned a four seated airplane, powered by a single 150 h.p. engine. The defendant, a commercial airline company was the owner of a DC-6 four motored cargo plane which had been in the hangar at the southeast end of the airport in question where one of its motors had been replaced just prior to the incidents hereafter related. All movements of airplanes to, from and on the airfield in question are controlled from the tower under the authority of the FAA and all licensed pilots are required to call for, receive and follow instructions on arriving, leaving or moving to go to or from a gate, hanger line or otherwise at the port.

Just shortly prior to the time the plaintiff landed his plane at the airport, the defendant, after requesting permission, and at the direction of the tower, taxied its DC-6 to the south end of runway 32 for "run-up" purposes.

When the DC-6 arrived at the "run-up" position as directed by the tower, its motors continued to "idle" and the "run-up" process, was commenced. Certain stages of the "run-up" process require the revving of one or more of the motors. There were three of defendants employees engaged in the "run-up," two mechanics and a flight engineer. They were inside the plane and because of its construction, could not see the area of the field to the rear of the place where the plane was standing. The most southerly part of runway 32 ends at the east side of the field at the easterly end of a east-west taxi strip and also at the south end of a taxi strip to the east of runway 32 and a taxi strip in front of the hangars and hanger line at the east side of the field. There is a triangular plot of sod between runway 32 and the taxi strip to the east which is about 200 feet wide at its northerly end. The DC-6 was standing facing south, 50 feet from the end of the runway for the "run-up." The length of the plane was 107 feet and the tail extended northerly to within 50 feet of the grass plot. The plaintiff, after getting permission to land from the tower, land-



ed in runway 18, which intersects runway 32 almost directly opposite the tower in about the center of the airport. After he turned off the active runway, having been ordered to wait for a commercial plane to take-off, he testified he was given permission to "taxi to the hangar line" without direction as to what runways or taxiways to use. Wanting to meet a friend at the south end of the field, he started south on runway 32 which he said was then inactive. When he got within 400 or 500 feet from the DC-6, he stopped. The plaintiff testified that as he taxied behind the DC-6 the mechanics proceeded to rev all four of the engines, putting their propellers into full pitch. His testimony was as follows:

"As I proceeded behind them—I didn't know there were two mechanics in the ship, which I found out afterwards. They proceeded to rev all four of their engines up, putting their propellers into full pitch. I don't know whether, that is the fact, or not, but that is what the mechanics stated. It only causes more turbulence, which is equivalent to a hurricane. So my ship turned right around just like a weather vane on top of the building. You have to think fast. You work your throttle with your hand. It is the same as if you push with your foot, where you accelerate with your foot. When you are taxiing, you are holding your control wheel, and pushing the throttle, working it not to taxi too fast. You have to slow down, and just watch yourself."

At the time the "air turbulence" hit plaintiff's plane, it was in about the middle of the sod area. He did not ask permission or notify the tower of his intention to leave runway 32 nor was there any claim that the tower notified the defendant's mechanics of plaintiff's presence in turning east over the sodded area. The plaintiff's plane was damaged when its left wing hit the sod when tipped up from "air turbulence" caused by defendant's mechanics is revving up the motors of the DC-6 as a necessary part of the "run-up."

The plaintiff claimed that the defendant was negligent and was, therefore, liable for the damage to his plane. The court found that there was no evidence of negligence by the defendant. The defendant, with direction from the tower, was in the act of testing his plane for flight. He was doing what he had asked permission to do

("run-up") at the place he was directed to do it. The fact was undisputed by the evidence that the mechanics in charge of the work could not see to the rear of the plane while testing the motors or was it necessary or customary that anyone be stationed on the ground outside the plane to warn others of air turbulence created as a necessary part of such tests. The defendant's mechanics had ear phones on to receive any communications that might be relayed from the tower. The plaintiff with the means at hand to make his position known, and with full knowledge that defendant's plane was standing on runway 32 with its motors running turned directly into the path of whatever air turbulence might be created by revving the DC-6 motors "run-up", a circumstance that could reasonably have been anticipated by the plaintiff. There was no evidence in the record of any negligence on the part of the defendant, as charged by the plaintiff. Consequently, the court entered judgment for the defendant.

### MPA NOTES

The Fall Fly-In at Viking Lodge, Whitefish, Montana was a terrific success. Between 80 and 100 attended. Chairman Ken Gregoire, Great Falls, even ordered perfect weather for the weekend. MPA member attending from the greatest distance was Walt Anderson, Ekalaka, Montana. Elena Massman, Pereira, Columbia, South America, who is visiting the Ernie Massman family from Columbia Falls, outdistanced us all.

"Hospitality," courtesy GTF Hangar, and swimming prefaced a fabulous dinner; more "Hospitality" and dancing followed.

The Hanging Tree, Town Pump and Blue Moon along with those hardy souls from Billings who didn't get around to trying out the pool until the wee hours, were topics of conversation at Sunday morning breakfast.

Bob Wills entertained both Saturday afternoon and Sunday morning with an unscheduled airshow over the lake in his homebuilt, three-quarter scale Stearman.

October 1, is the beginning of our membership drive for 1967. All Hangars have shown an increase in membership for 1966. **Join up now with MPA and let the world know how Montana flies.**

**H. K. (Red) DuPree, President  
Montana Pilots Association**

### SHAY ELECTED INAC PRESIDENT; McPHERSON & MICHAEL—MONTANA DIRECTORS

Ex-Montanian, Donald G. Shay of Seattle was elected President for the coming year by the International Northwest Aviation Council at their Vancouver, B.C. convention in early September. Seattle was named the site for the 1967 Convention. New Montana Director is Robert Michael of Billings and C. E. "Sandy" McPherson of Helena was re-elected. Eleven Montanians attending the very successful convention were: Mr. Charles A. Lynch, Director, Aeronautics Commission, Helena; Mr. James H. Monger, Assistant Director, Aeronautics Commission, Helena; Mr. and Mrs. Kelleher, Airport Manager, Helena; Mr. and Mrs. C. E. "Sandy" McPherson, Airport Board, Helena; Mr. Robert D. Michael, Airport Manager, Logan Field, Billings; Mr. A. J. Gore, Airport Board, Billings; Mrs. and Mr. Tom Palmer, Airport Manager, International Airport, Great Falls; and Don L. Brown, District Supervisor, Montana Fish and Game Dept., Kalispell.



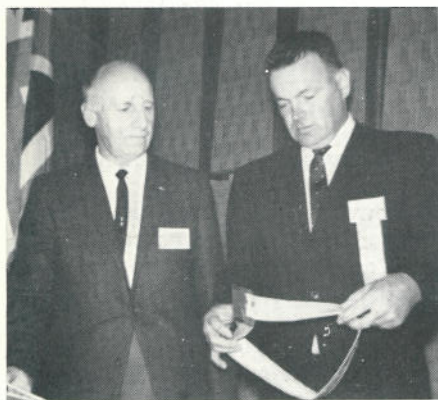
**Featured speaker for the American Night Banquet, Francis T. Fox, President American Association of Airport Executives. (Seated at Right) newly elected INAC president, Donald G. Shay of Seattle.**

MAC Director Lynch appeared on a panel of State Aeronautics Directors and Provincial Aviation Council Presidents. Each gentleman gave a presentation on various aviation projects in their individual state or province.

Mr. Don Brown, of the Montana Fish and Game Department, gave an excellent talk on "Use of the Heli-



copter in Game Management."



**Don Brown, Montana Fish and Game Dept. representative, explains the use of neck band marking of elk to Montana INAC Director, C. E. "Sandy" McPherson.**

A very special feature of the convention was the presentations of the National Aeronautics and Space Administration by Spacemobile Operations Center co-ordinator, Harold R. Bacon, formerly of Three Forks, Montana and Mr. Warren Bartanen.



**Harold R. Bacon, of NASA, showing a scale model of Gemini Space Capsule.**

The Montana delegates stated that the convention was certainly one of the very best ever! It was well planned from the first day through the final banquet—excellent speakers, interesting meetings and all around good entertainment.

Congratulations to the out-going president, Art Parry of Vancouver; over-all convention program chairman Dennis C. Rennick, of Regina, Sask.; C. E. "Sandy" McPherson, chairman of the U.S. program and all committees.

## **WINTER FLYING IN MONTANA**

**By: R. A. Dightman  
WBAS—Helena, Montana**

This year (1966) summer has lasted a long time, and flying weather as a whole has been very good. In fact, in the memory of many veteran pilots there have been few if any summers when the flying weather has been consistently less of a problem. This has another side, though, which is shown by the intensifying drought in Southwestern Montana. But for aviation purposes the summer has been excellent; any pilot wanting flying hours has had only minor—if any—weather problems.

This has been all to the good; but we know that it can't and won't last forever! As the season in Montana moves through autumn and into winter, most of the familiar late-year flying weather patterns will return, including valley fogs, mountain wave turbulence, wind, snow ice, etc., most of which Montana pilots have not seen for several months. Some of the best flying weather of the year can occur on some clear and cool late fall and early winter days, but even here one must be on guard against local valley or ridge winds and accompanying wind shear and turbulence.

We all "winterize" our automobiles and to some degree the way in which we drive. To some extent, the same approach also applies to aviation. Aircraft will be winterized, and the handling of winter weather flying problems will be reviewed—at least it should be. Some of the items to check include:

**1. FOG.** Although most common during Fall and Winter in Western Montana's valley complex, fog can occur anywhere in the State under certain conditions. Clear, still Fall and Winter nights almost always will produce fog in many valleys West of the Divide—but this fog type can occur in any valley. It is quite possible for two reporting weather stations, such as Drummond and Missoula, to have clear weather on such nights, while fog can form almost anywhere in between. Another type of fog or stratus common in Western Montana is that which forms when rain or wet snow falls along mountain ridges. It can last for hours after precipitation has ended, effectively covering the mountains from view, and in some cases making VFR over the mountains dif-

ficult or impossible. In those weather patterns which favor fog formation, the possibility of fog should be a part of the pre-flight check.

**2. SNOW.** Snow challenges VFR flights in many ways. It can obscure or partially obscure the horizon; it can make visibility look better than it really is; it can freeze on a parked aircraft; it can make landings difficult or impossible—depending upon depth on the runway; it changes the landscape; it can block an air filter; it may lead to slush and ice; etc. These hazards of snow are pretty well known, but it is a chore to review them quickly, after a long summer, when a snow squall or storm shows up ahead during a flight. It is a good idea to think about them in advance before planning a flight under one or more of the many snow conditions that can occur. One piece of advice overheard from a veteran pilot; "Don't fly into an area of falling snow unless IFR can safely be used. This applies to all snows with visibilities less than 5 or 6 miles." We think it should apply to all snows, regardless of visibility, unless the snow obviously is in the form of scattered light flurries with plenty of blue sky in between.

**3. WIND AND TURBULENCE.** Strong winds (sometimes very strong indeed in some areas) are a fairly common problem during the cold season, particularly during the so-called "chinook" season, East of the Continental Divide. Blowing across mountain ridges, these winds produce mechanical turbulence in the air flow, sometimes causing turbulence to heights well above the mountains. Good indexes of the wind flow strength, and rough indicators of the degree of turbulence, are the surface winds reported hourly by FSS at Cut Bank and Livingston, and the WBAS at Great Falls.

**4. OTHER.** Carburetor icing, fronts, etc., all are more or less common weather factors influencing flight planning, both pre and enroute. But here we have invited attention to only a few of the more important winter flight weather elements.

Any reader who would like more detail can find it in AVIATION WEATHER, 1965, published by the FAA and Weather Bureau, in which flying weather is covered in great detail and in easily understood language (well illustrated) on about 300 pages.



If interested in a copy of your own just ask your nearest flight instructor. If not available locally, it is obtainable from Superintendent of Documents, Government Printing Office, Washington, D.C. 20402.

Have a good winter!

## FEDERAL AVIATION AGENCY ITINERARY LISTING

Airport	Oct.	Nov.	Dec.
Culbertson .....	5		7
Glasgow .....		9	
Glendive .....	19		14
Great Falls .....	6	3	8
Miles City .....	20		15
Missoula .....	20	17	22
Sidney .....		16	

Note: Provisions have been made to give Private, Commercial/airplane and Flight Instructor/airplane and Instrument written examinations ON AN APPOINTMENT BASIS ONLY at the following FAA Flight Service Stations.

Bozeman	Lewistown
Butte	Livingston
Cut Bank	Miles City
Dillon	Missoula

## AIRLINE NEWS

### FRONTIER'S 727 MAKES OFFICIAL FIRST LANDINGS BILLINGS & GREAT FALLS

Following the September 8 delivery of Frontier Airlines' first 96 passenger Boeing 727 in Seattle, a team of company officers, headed by Lewis W. Dymond, President and Chairman of the board, accompanied by several Boeing representatives began the proving flight from Seattle through the 11 state region served by the Denver based carrier. The First official landing was made at Billings, next stop—Great Falls. After leaving Montana, Frontier's "Arrow-Jet" continued its proving flight and made official first landings at Omaha, Kansas City, Lincoln, Albuquerque, El Paso and Denver.

Frontier is the first regional carrier in the United States to buy the Boeing 727. It has an order for five of the aircraft with an option for five more of the \$5 million jets.

Both first class and coach services are provided on the 727 with 24 seats making up the first class section and 72 seats in the coach section. The "Arrow-Jet" will also carry over 10,000 pounds of mail, express, and air freight in two pressurized and heated cargo holds in the lower deck of the aircraft.

Until the first "Arrow-Jet" goes into scheduled service September 30, Frontier will use its 727 for additional training and familiarization for flight crews, ground maintenance, and other



Frontier's new "Arrow Jet" after making official First Landing at Billings. Seen far right is Frontier's President Dymond and Peter Black, Frontier's Montana Sales Manager and Aeronautics Commissioner.

personnel. On September 30, the \$5 million plane will be placed in scheduled service over certain high passenger density routes of Frontier's system. Following delivery of Frontier's second 727 in October, Frontier will inaugurate a more extensive schedule of service throughout much of its system.

### WEST COAST AIRLINES— REPLACES DC-3's ON MONTANA RUN

The replacement of DC-3's with 40-seat, 300 mph F-27 turbo-props on the Montana run connecting Spokane-Kalispell-Great Falls was announced by West Coast Airlines.

This will coincide with two other major events within the company's 40,000-mile, six-state system.

Number One, the inauguration of DC-9 fanjet service at seven cities.

Number Two, West Coast Airlines has been awarded nonstop flight privileges between Seattle and Portland by the Civil Aeronautics Board, and began 45-minute service September 26.

Previously, West Coast Airlines has been required to stop at least once between Portland and Seattle, and since 1963 this has meant a stop at Tacoma.

The September 26 schedule will retain Tacoma on two daily roundtrips, but on three others, the DC-9 fanjets and F-27s will fly directly between the two cities. A sixth daily roundtrip flight will cover the original coastal route which includes Olympia, Aberdeen-Hoquiam, and Astoria.

## CONGRATULATIONS



### CERTIFICATES ISSUED RECENTLY TO MONTANA FLYERS

#### STUDENT

Nuefeld, Kenneth L.—Havre  
Kozich, George J.—Great Falls  
Dupuis, Robert R.—Polson  
Jackson, Helene L.—Missoula  
Johnson, James E.—Philipsburg  
LaCroix, Caroyl Mae—Great Falls  
Matchett, Alvin T.—Great Falls  
Odefey, Marvin L.—Great Falls  
Rostad, Orville P.—Martinsdale  
Sears, Deborah J.—Conrad  
Eck, William B.—Bozeman  
Toney, Kenneth T.—Townsend  
Larson, Philip F.—Wilmont, Minn.  
Wartenbe, John F.—Malmstrom AFB  
Malecha, Norlan J.—Malmstrom AFB  
Gehring, Clifford D., Jr.—Lincoln  
McKinley, Lawrence R.—Chinook  
Martin, Harold C.—Whitefish  
Wright, Ted Terry—Shelby  
Utz, Edward S.—Billings  
Cyphers, Raymond J.—Powell, Wyo.  
Barrier, William A.—Red Lodge  
Jenni, Thomas C.—Lewistown  
Mackay, Douglas—Roscoe  
Klock, Harry W.—Harlowton  
Miner, Norton R.—Billings  
Baird, Melvin N.—Billings  
Staben, Jon C.—Malmstrom AFB  
Duffy, Walter R.—Butte  
Spangler, Holly F.—Great Falls



Alexander, Thomas L.—Alexandria Va.  
 Warren, John W.—Great Falls  
 Poncelet, Eugene—Great Falls  
 Waldenberg, Terry E.—Great Falls  
 Baxter, Robert T.—Great Falls  
 Balyeat, Robert E.—Great Falls  
 Cote, John L.—Great Falls  
 Glenn, James L.—Bozeman  
 Peden, Donn H.—White Sulphur Springs  
 Haapala, Marvin H.—Bozeman  
 Willis, Ronald J.—Kalispell  
 Powers, Dona D.—Great Falls  
 Ridgway, Betty Jo—Missoula  
 Terry, Clifford E.—Plains  
 Backlund, Jerry L.—Helena  
 Bitz, Sampsel J.—Havre  
 Thompson, William W.—Kalispell  
 Hebbelman, Gina K.—Chinook  
 Bruce, Robert C.—Helena  
 Alderson, Bryce H.—Oregon  
 Campbell, Harry B.—Missoula  
 Hill, Uno I.—Milltown  
 O'Haire, Edgar L.—Great Falls  
 Ries, Ronald E.—Missoula  
 Walstad, Neil R.—Missoula  
 Vankemper, Theodore M.—Great Falls  
 Samuels, Glen A.—Great Falls  
 Nelson, Gregory T.—Great Falls  
 Flaherty, Edward—Great Falls  
 Clack, Philip D.—Great Falls  
 Dooling, John S.—Jackson  
 Klabunde, Maurice—Havre  
 Lee, Charles K.—Denton  
 Gilmore, Raymond W.—Billings  
 Olsen, Douglas C.—Billings  
 Holten, Larry P.—Columbus  
 Finner, Richard R.—Baker  
 Miller, Thomas L.—Billings  
 Lawsen, Jack T.—Billings  
 Lidderdale, Charles A.—Billings  
 Castberg, James P.—Powell, Wyo.  
 Kaufman, Larry K.—Billings  
 Skovgaard, Dennis R.—Billings  
 Gordon, Gregory S.—Billings  
 Estes, Ronald N.—Billings  
 Wallace, Mark E.—Laurel  
 Shipley, Robert B.—Miles City  
 Redding, Robert A.—Joliet  
 Stevens, Janet H.—Two Dot  
 Ugrin, Gregory S.—Miles City  
 Scott, Thomas W.—Dayton, Wyo.  
 Hansen, William P.—Billings  
 Mackay, David—Roscoe  
 Lundquist, Allan J.—Billings  
 Lab, John W.—Culbertson  
 Nystul, Gary W.—Columbus  
 Woolhiser, Lyle D.—Miles City  
 Tower, Harvey L.—Billings  
 Branum, Keith A.—Roundup  
 Henry, Robert C.—Deaver, Wyo.  
 Barnett, Paul W.—Hubbard, Texas  
 Fink, Rodney L.—Columbus

Carpenter, Stephen W.—White Water, Wis.  
 McCabe, Paul R.—Billings  
 Dibble, Gary O.—Stanley, N.D.  
 Desmul, David R.—Billings  
 Hungerford, Robert B.—Billings  
 Wallace, Walter H.—Billings  
 Moulton, David C.—Billings

#### PRIVATE

Little, Amos R. III—Helena  
 Creek, Jack L.—Great Falls  
 Engebretson, John D.—Kalispell  
 Jacobsen, Peter A.—Missoula  
 Warren, John W., Jr.—Missoula  
 Triplett, Donald L.—Great Falls  
 Dodds, Ray—Great Falls  
 Swan, James W.—Butte  
 Bishop, Douglas M.—Kalispell  
 Davies, Mark D.—Chinook  
 Fontaine, Eldon, Great Falls  
 Wahl, Richard J.—Cut Bank  
 Robins, Bernice A.—West Glacier  
 Moore, Creighton K.—Kalispell  
 Odland, Lyle A.—Minot, N.D.  
 Tipp, Karen G.—Missoula  
 Castleman, Harry L.—Great Falls  
 Schrader, Robert G.—Cody  
 Scheidecker, Perry A.—Laurel  
 Hancock, William J.—Billings  
 Frazee, Ronald L.—Billings  
 Posey, Gary L. R.—Miles City  
 Clark, Archer A.—Grassrange  
 Worthington, Robert A.—Billings  
 Bretz, Lavon R.—Great Falls  
 Baker, Gerald L.—Billings  
 Glenna, Howard D.—Billings  
 Argyle, Lloyd E.—Billings  
 Foeste, William J.—Billings  
 Fehlberg, Robert E.—Billings  
 Paddelford, Franklin L.—Lander, Wyo.

Long, Evelyn M.—Riverton, Wyo.  
 Zeh, Dennis J.—Bay City, Mich.  
 Beck, Donald R.—Deer Lodge  
 Widerrick, Daniel F.—Regina  
 Holland, Swend R.—Lewistown  
 Belcher, Ronald H.—Lavina  
 Hanson, Ronald H.—Billings  
 Schye, Ted E.—Glasgow  
 Neudecker, Joan M.—Billings  
 Wedel, Elvin J.—Hardin  
 Rudin, Judith A.—Geraldine

#### BLUE SEAL

#### ADVANCED AND SPECIALIZED COMMERCIAL

Holman, Robert C.—Great Falls  
 Wood, Eddie G.—Great Falls  
 Lundstrom, Robert A.—Big Timber  
 Cheney, William H.—Casper, Wyo.  
 Currie, James M.—Big Horn, Wyo.  
 Patrick, Larry D.—Rudyard  
 Deichl, Andrew J.—Billings  
 Blair, George T.—Bozeman  
 Womack, William L.—Billings

Eason, Thomas R., Jr.—Glasgow  
 Madsen, Gordon R.—Moose Jaw, Sask.  
 Nordick, Arnold L.—Manitoba  
 McPhail, Lawrence D.—Manitoba  
 McCue, Michael J.—Cody

#### INSTRUMENT

Anderson, Robert W.—North Branch, Minn.  
 Butler, James F.—Seneca, N.Y.  
 Kenstler, Kevin E.—Sturgis, S.D.  
 Rognaldson, Allan W.—Great Falls  
 Lundstrom, Robert A.—Big Timber  
 Agnew, Colvin H.—Billings  
 Bell, Ronald L.—New South Wales  
 Peiler, Alan H.—Anamoose, N.D.  
 Sauter, Allen—Harvey, N.D.  
 Foe, Robert T.—Greybull, Wyo.  
 Darst, Charles D.—Clarkston, Wash.  
 Patrick, Larry D.—Rudyard  
 Clark, Edwin O.—Billings  
 Madsen, Gordon R.—Moose Jaw  
 Nordick, Arnold L.—Manitoba  
 McPhail, Lawrence D.—Manitoba  
 Gnose, Donald D. Jr.—Missoula  
 Conklin, Robert P.—Butte

#### MULTI ENGINE

Haug, Lowell A.—Fargo, N.D.  
 Lundstrom, Robert A.—Big Timber  
 Barrett, John L.—Cascade  
 Mamuzich, John M.—Conrad  
 Carson, Peter A.—Townsend  
 Sauter, Allen—Harvey, N.D.  
 Peiler, Alan H.—Anamoose, N.D.

#### FLIGHT INSTRUCTOR

Gordon, Walter J.—Aladdin, Wyo.

#### GROUND INSTRUCTOR

#### AND/OR GROUND

#### INSTRUCTOR INSTRUMENT

Currie, James M.—Big Horn, Wyo.  
 Dorrance, George A.—Livingston

#### SEAT TYPE ADDED

#### SENIOR PARACHUTE RIGGER

Nord, David A.—Pelican Rapids, Minn.

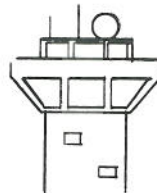
Hanson, Lowell A.—Mahnommen, Minn.

#### POWERPLANT MECHANIC

Holloway, Charles C.—Great Falls  
 Settle, Robert C.—Wibaux

#### RADIO REPAIRMAN

Murphy, Glenn J.—Billings



## TOWER

## OPERATIONS

AUGUST, 1966

	Total Operations	Instrument Operations
Great Falls	13,578	496
Billings	13,459	656
Missoula	7,287	113
Helena	4,901	52



## 4,000 ENJOY HAVRE'S AVIATION DAY



Governor and Battin are welcomed by Havre Mayor, Peter Hamilton (far left) and Jess Angstman, local attorney (far right).

Governor Tim Babcock and Congressman James Battin joined the throng attending the Aviation Day at Havre on September 11th. A number of aircraft arrived from Denver, Utah, Saskatchewan, Glasgow, Malta, Billings, Lewistown and Helena.

A total of 533 paid rides were given at 1½ cents per pound. Pilots flying the rides were: Walt Hensley, Wayne Turner, Jim Sleeter, Terry Anderson, Gordon Sands, Ira Ernst, Harold Ebaugh, Chauncey Flynn, Lloyd Vande Sandt, Ray Vogel, Joe Osterbauer, Arnold Sorensen, C. P. Bartley, Billings, and Neil Church of Denver, Colorado. A number of the pilots furnished their own aircraft and planes owned by Melvin Van Wechel, Lyle Anderson, Hill County Electric Co-op, Hensley Flying Service and Donald Courtneage were used.

Two highlights of the days events were an interesting exhibition of helicopter maneuvering skill by two Montana National Guard pilots, Allen Blanchard and Blair Hamer, both of Helena and an aerial spraying demonstration of the new Cessna Ag-Wagon.

In the wide variety of displayed aircraft was a fine example of a home built—"The Starduster" constructed, owned and flown by Gordon Schmidt of Great Falls.

Members of the Fort Assiniboine and Hi-Line antique car clubs exhibited their automobiles and operated the food concession stand throughout the day. Much to their delight, local

Boy Scouts, operating a popcorn concession were treated to a plane ride in Governor Babcock's personal twin-engine aircraft.

The Air Police from Havre Radar Station were highly commended on the excellent job of directing the crowds and traffic and maintaining safe conditions. The Jaycees provided a Public Address System which kept the crowd informed during the flying events with commentary by Emil Eliason.

Havre MPA Hangar President, Ray Vogel and secretary Frances Hensley handled the details for Aviation Day and certainly deserve the highest praise for a very successful venture. All participants did a fine job and certainly gave the attending crowd a "Great Show."



Frances Hensley gasses Gordon Schmidts "Starduster".

## FEDERAL AVIATION AGENCY VFR EXAM-O-GRAM

### An Invisible Hazard To Light Aircraft

The Civil Aeronautics Board listed the probable cause of a recent fatal light aircraft accident as structural failure of a light aircraft resulting from excessive airloads created by wing-tip vortices behind a large aircraft. The report also states: "The dangers of wake or vortex turbulence are still unknown to many pilots."

#### Discussion of Wing-Tip Vortices

**1. WHAT ARE WING-TIP VORTICES?** It is unfortunate that vortices are invisible. If you could see them, they would look like a pair of horizontal tornadoes stretching back from each wingtip. These violent, compact, and fast-spinning air masses extend behind an aircraft for miles. Many pilots refer to this phenomenon as "prop wash" or "jet wash," but engineering studies have revealed this term as a misnomer. The main source of this disturbance is not from the power plant; it is from the wingtips.

**2. WHY ARE THEY DANGEROUS?** They are dangerous because all tests to date indicate that **structural failure in the air** can occur in light aircraft upon penetration of the vortices behind larger transport aircraft. During takeoff or landing, care should be taken to **avoid vortex disturbance**. Loss of control could be the result at a critical time when control is of prime importance to safety.

**3. UNDER WHAT CONDITIONS ARE THEY MOST DANGEROUS?** There are many factors affecting the intensity of wind-tip vortex, but it is a safe and practical generalization that **the bigger the airplane the more violent and long-lived** will be the vortex disturbance. The source of this insidious danger can be out of sight by the time you encounter the wake. For example, when a large jet aircraft climbs at approximately 420 mph, the peak turbulence is **3-½ miles** behind, and a relatively high degree of turbulence will exist for **7 miles**. The most severe turbulence, however, is left by a large aircraft when it is flying at slow operational speeds—immediately after takeoff or just before landing.

**4. WHAT ACTION CAN THE PILOT TAKE TO AVOID OR REDUCE THIS HAZARD?**

a. Avoid passing behind any large



aircraft.

b. Avoid, when possible, places and altitudes frequented by large aircraft. Constantly monitor your radio for location of such aircraft.

c. If you pass behind a crossing aircraft in flight, change altitude and slow down (at half the speed the shock will be only one-fourth as great).

d. If you do get into a bad vortex in flight, your best procedure is to throttle back, "ride it out," and avoid "fighting the controls" since to do so many aggravate the condition.

e. When taking off or landing behind large aircraft, be on the alert for the first sign of turbulence; allow adequate spacing, maintain higher than normal speeds, use the windward side of the runway, and maintain a flight path to the windward of the preceding aircraft.

## STATISTICS

(Montana Aircraft Accidents)

	61/37	
	65/22	
	51/20	
	62/11	
	Accidents	Fatalities
	Total	
1964 Total	61	37
1965 Total	65	22
1965 as of this date	51	20
1966 as of this date	62	11

FOR SALE: 1961 Piper 250 Comanche—125 hrs. since Major—970 hrs. TT—fully equipped and excellent in every way. Will finance on the most reasonable terms offered anywhere in USA for party with approved credit. Call Ben Shennum, 1821 Holborn, Missoula, Montana. Phone 543-8373.

FOR SALE: 1959 Bellanca 230 Cruisemaster. Fabric top green—always hangered. High compression drop 6%. No oil consumption. 1,000 hr. TT. Price \$7,500 with new periodic. Contact: G. K. Gregoire, Box 1585, Great Falls.

FOR SALE: 1948 Aeronca Sedan. Fresh periodic. New Paint. 370 hrs. SMOH. Skis and spray rig included. Price: \$3,500. Contact: Chuck Jacobsen, Seaton Ranch, Fort Shaw, Mont.

FOR SALE: 1956 Cessna 172—1,285 TT—400 SMOH—full panel—full paint—wheel fairings—VHT3—clean. Will sell or trade on clean low time Skylane. Contact: Bob Boyce, 1025 Longstaff, Missoula.

WANTED TO BUY: Clean, low time Skylane. Will pay cash or trade 1956 Cessna 172. Contact: Bob Boyce, 1025 Longstaff, Missoula.

FOR SALE: 1955—170/B; 1618 TT—838 SMOH—Narco Mark II, Mark VI & LFR 3—Grimes Beacon—Stall Warner—SA, Electric T&B—R of C—Clock—OAT—Full IFR panel—Sunvisors—New license on sale. Very clean. Price: \$5,500. Phone. 732-7980, Butte.

FOR SALE: 1948 Cessna 120—Newly annualized—Ceconite fabric—3 radios—Fully IFR equipped—Metal prop—Eyebrow panel lighting—Landing lights—Rotating Beacon—plus other extras. Price \$3,000. Contact: Wendel R. New, P.O. Box 375, Fort Peck, Montana.

### MEMBER

#### NATIONAL ASSOCIATION OF STATE AVIATION OFFICIALS

PURPOSE:—"To foster aviation as an industry, as a mode of transportation for persons and property and as an arm of the national defense; to join with the Federal Government and other groups in research, development, and advancement of aviation; to develop uniform laws and regulations; and to otherwise encourage co-operation and mutual aid among the several states."

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Helena, Montana

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OCTOBER, 1966

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